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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,609	03/07/2001	John David Begin	60314-196	7492

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EXAMINER

LEE, BENJAMIN C

ART UNIT PAPER NUMBER

2632

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/800,609	BEGIN, JOHN DAVID	
	Examiner	Art Unit	
	Benjamin C. Lee	2632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

Claim Status

1. Claims 1-16 are pending.

Claim Rejections - 35 USC § 103

2. Claims 1-4, 6, 9-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA, pages 1-2 of Applicant's specification) in view of Weiberle et al. (EP1147929A1).

1) In considering claims 1-4, 6, 9-11 and 13:

a) AAPA discloses the known method of propagating a previous position to a current position in a vehicle navigation system, by determining a vehicle pitch, heading, speed, roll and their respective changes, and using them to propagate a previous position to a current position in inertial vehicle navigation, except that such known method uses information from a gyro in addition to longitudinal, vertical and lateral acceleration information from accelerometers including a multi-axis accelerometer (page 1, line 9 to page 2, line 13); while

b) Weiberle et al. teaches the known determination of pitch and roll information based on longitudinal, vertical and lateral acceleration information without the use information from a gyro (Abstract, page 3 & Fig. 5).

In view of AAPA and Weiberle et al., it would have been obvious to one of ordinary skill in the art at the time of the claimed invention that since vehicle pitch and roll information for use in position propagation determination in a system/method as taught by AAPA can also be determined from the longitudinal, vertical and lateral acceleration information from accelerometer(s) as taught by Weiberle et al., the gyro(s) for determining vehicle pitch and roll

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information can be eliminated to reduce the number of sensor elements and connections and thus their associated cost and maintenance efforts.

2) In considering claim 14, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 13, whereby:

Since neither AAPA nor Weiberle et al. requires that the steps of “receiving inertial sensor signals and determining vehicle pitch based on those signals” to be performed only while the vehicle is not moving, those steps are inherently performed under conditions including while the vehicle is moving.

3. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Weiberle et al.

1) In considering claim 15, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 13, whereby:

Since one or more of the inertial parameters, and associated determination, of vehicle pitch, roll, speed, heading and their respectively changes that are used in propagating a previous position to a current position vary depending on whether the vehicle is moving or not, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to determine whether the vehicle is not moving, and perform said steps of “receiving inertial sensor signals and determining pitch based on the inertial sensor signals” based upon said step of “determining whether the vehicle is not moving” when said vehicle is not moving in a method such as taught by AAPA and Weiberle et al.

2) In considering claim 16, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 13, whereby:

Since it has been well known to use inertial navigation sensors to supplement or complement non-inertial navigation sensors, so that it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to perform pitch determination using inertial sensor signals only under low noise situation under which the inertial sensor operates by monitoring to prevent erroneous determinations in a method such as taught by AAPA and Weiberle et al.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Weiberle et al. and Shimizu et al. (US Pat. No. 5,115,238).

1) In considering claim 7, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 4, while:

Shimizu et al. teaches the known determination of vehicle heading information from map-matching (col. 5, lines 41-47).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention that the heading information for use in current position propagation such as taught by AAPA and Weiberle et al. can be obtained by map-matching as known in the art such as taught by Shimizu et al. so that additional or separate sensors are not needed to reduce components and connections/mounting assemblies and associated costs

5. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Weiberle et al. and Kato et al. (US Pat. No. 5,796,613).

1) In considering claim 8, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 4, while:

Kato et al. teaches the known determination of vehicle heading information from GPS velocity information (218 in Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention that the heading information for use in current position propagation such as taught by AAPA and Weiberle et al. can be obtained from GPS velocity information as known in the art such as taught by Kato et al. if GPS is used so that additional or separate sensors are not needed to reduce components and connections/mounting assemblies and associated costs.

2) In considering claim 12, AAPA and Weiberle et al. met all of the claimed subject matter as in claim 11, while:

Kato et al. teaches the known determination of vehicle speed information from GPS velocity information (216 in Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention that the speed information for use in current position propagation such as taught by AAPA and Weiberle et al. can be obtained from GPS velocity information as known in the art such as taught by Kato et al. if GPS is used so that additional or separate sensors are not needed to reduce components and connections/mounting assemblies and associated costs.

Response to Arguments

6. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

1) Claims 1-16 have been rejected under new grounds of rejection by introduction of new prior art of Applicant's admitted prior art in the specification and Weiberle et al. Furthermore, since Applicant did not separately indicate which, how and why the "important limitations" of

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claims 7 and 15-16 by themselves are patentable, the above rejection is deemed proper. See above rejection for detail.

2) Applicant is further invited to consider the newly cited Morgan et al. prior art below, which is similar to the Morgan et al. (US 6564148) patent used in the previous Office action but has proper effective date, as well as the other newly cited prior art of Adachi et al. and Nakamura et al. below, in formulating the response to this Office action in the spirit of facilitating speedy prosecution.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Morgan et al., US Pat. #6,085,149

--A similar inertial navigation system using inertial sensor outputs in determining parameters including vehicle pitch.

2) Adachi et al., US Pat. #5,208,749

--A similar vehicle pitch angle determination system (39 in Fig. 5) using longitudinal and vertical acceleration signals.

3) Nakamura et al., US Pat. #5,408,411

--A similar vehicle parameter determination system.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin C. Lee whose telephone number is (571) 272-2963.

The examiner can normally be reached on Mon -Fri 11:00Am-7:30Pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Wu can be reached on (571) 272-2964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Benjamin C. Lee
Primary Examiner
Art Unit 2632

B.L.